DIN ISO 19202-1



ICS 97.220.10

Supersedes DIN 33960-1:2012-08

Summer toboggan runs -

Part 1: Safety requirements and test methods (ISO 19202-1:2017), English translation of DIN ISO 19202-1:2018-02

Sommerrodelbahnen -

Teil 1: Sicherheitstechnische Anforderungen und Prüfverfahren (ISO 19202-1:2017), Englische Übersetzung von DIN ISO 19202-1:2018-02

Pistes de luge d'été -

Partie 1: Exigences de sécurité et méthodes d'essai (ISO 19202-1:2017), Traduction anglaise de DIN ISO 19202-1:2018-02

Document comprises 50 pages

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original shall be considered authoritative.



A comma is used as the decimal marker.

Contents

				Page	
Nati	ional for	eword		4	
Nati	ional An	nex NA (informative) Bibliography	5	
			, G , V		
1	Scop	e		7	
2	Norr	eferences	7		
3	Terms and definitions				
4	List	of signifi	icant hazards	9	
5	Safety requirements				
	5.1 Manufacturing				
	0.1	5.1.1	Materials		
		5.1.2	Safety measures against loosening of connections		
		5.1.3	Welded joints		
		5.1.4	Corrosion and surface protection, protection against rot		
	5.2		gan		
	J	5.2.1	General		
		5.2.2	Toboggan for rail-guided summer toboggan runs		
		5.2.3	Toboggan for tub-guided summer toboggan runs		
		5.2.4	Braking		
	5.3	Track		13	
		5.3.1	Structural design of the system on the site	13	
		5.3.2	Rail-guided summer toboggan runs		
		5.3.3	Tub-guided summer toboggan runs		
		5.3.4	Visibility down the track and braking distances		
	5.4	Entrar	nce and exit area	14	
		5.4.1	General	14	
		5.4.2	Entrance areas	15	
		5.4.3	End of downhill track	15	
		5.4.4	Exit areas	15	
	5.5	Uphill	transport system		
		5.5.1	General	15	
		5.5.2	Technical design		
		5.5.3	Means of conveyance and connection to the means of conveyance		
		5.5.4	6		
		5.5.5	Drives and their components		
	5.6 Special safety equipment and precautions				
	5.7		ince zone		
		5.7.1	Downhill travel		
		5.7.2	Uphill transport		
	F 0	5.7.3	Squeezing and shearing points		
	5.8		ical equipment		
		5.8.1	Electrical systems		
		5.8.2	Control systems		
6	Calculations				
	6.1	General			
	6.2		18		
		6.2.1	General		
		6.2.2	Permanent actions	21	

		6.2.3 Variable actions		
		6.2.4 Accidental actions		
		6.2.5 Impact		
	()	6.2.6 Vibrations occurring in directly passable components		
	6.3	Strength verification by calculation		
		6.3.2 Toboggan calculation		
		6.3.3 Tub calculation		
		6.3.4 Rail calculation		
		6.3.5 Calculation of supporting structure		
		6.3.6 Brake calculation	25	
	6.4	Verification of fatigue		
	0.1	6.4.1 General		
		6.4.2 Fatigue loads		
	6.5	Verification of stability		
	0.0	6.5.1 Safety against overturning, sliding and lifting off		
		6.5.2 Ground anchorages		
7	Testing and inspection			
,	7.1	General		
	7.2	Examination of the technical documentation		
	7.3	Acceptance test prior to commissioning (initial acceptance test)	33	
		7.3.1 General	33	
		7.3.2 Functional check		
	7.4	Periodic inspection		
	7.5	Inspection after modification		
		7.5.1 Examination of calculations		
		7.5.2 On-site inspection		
	7.6	Test report	36	
8	Mark	ing		
	8.1	Summer toboggan run		
	8.2	Toboggan	37	
9	Commissioning			
10	Technical documentation			
	10.1	General		
	10.2	Construction specification		
	10.3	Structural drawings and manufacturing drawings	37	
	10.4	Structural calculations		
	10.5	Risk assessment		
	10.6	Operating manual	38	
Annex A (informative) Example of load combinations in accordance with EN 1993				
Annex B (normative) Track calculation				

National foreword

This standard includes safety requirements within the meaning of the *Produktsicherheitsgesetz (ProdSG)* (German Product Safety Act).

This international document (ISO 19202-1:2017) has been prepared by Technical Committee ISO/TC 83 "Sports and other recreational facilities and equipment" (Secretariat: DIN, Germany).

The responsible German body involved in its preparation was *DIN-Normenausschuss Sport- und Freizeitgerät* (DIN Standards Committee Sports Equipment), Working Committee NA 112-07-05 AA "Summer toboggan run".

Where this standard has been identified by the *Ausschuss für Produktsicherheit* (German Committee for Product Safety) and reference to it has been published in the *Gemeinsames Ministerialblatt* (German Joint Ministerial Gazette) by the *Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA)* (German Federal Institute for Occupational Safety and Health), it is to be presumed that summer toboggan runs which comply with this standard fulfil the relevant health and safety requirements.

The DIN documents corresponding to the international documents referred to in this document are as follows:

IEC 60364-5-54 DIN VDE 0100-540 (VDE 0100-540)

IEC 61508 (all parts)
ISO 9606 (all parts)
DIN EN ISO 9606 (all parts)
DIN EN ISO 9606 (all parts)

ISO 13849-1 DIN EN ISO 13849-1
ISO 13857 DIN EN ISO 13857
ISO 12100 DIN EN ISO 12100
ISO 19202-2 DIN ISO 19202-2
ISO/IEC 17020 DIN EN ISO/IEC 17020

ISO/TR 7250-2 DIN CEN ISO/TR 7250-2 (DIN SPEC 91279)

Amendments

This standard differs from DIN 33960-1:2012-08 as follows:

- a) the number of the standard has been changed due to the adoption of ISO 19202-1;
- b) the Scope has been extended;
- c) normative references have been updated;
- d) the clauses and subclauses given in Table 1 have been revised;
- e) Clauses 5 and 6 have been technically revised;
- f) the annexes have been revised;
- g) the standard has been editorially revised.

Previous editions

DIN 33960-1: 2010-05, 2012-08

National Annex NA (informative)

Bibliography

DIN CEN ISO/TR 7250-2 (DIN SPEC 91279), Basic human body measurements for technological design — Part 2: Statistical summaries of body measurements from national populations

DIN EN 61508 (all parts), Functional safety of electrical/electronic/programmable electronic safety-related systems

DIN EN ISO 9606 (all parts), Qualification testing of welders — Fusion welding

DIN EN ISO 12100, Safety of machinery — General principles for design — Risk assessment and risk reduction

DIN EN ISO 13849-1, Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design

DIN EN ISO 13857, Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs

DIN EN ISO/IEC 17020, Conformity assessment — Requirements for the operation of various types of bodies performing inspection

DIN ISO 19202-2, Summer toboggan runs — Part 2: Safety requirements for operation

DIN VDE 0100-540 (VDE 0100-540), Low-voltage electrical installations — Part 5-54: Selection and erection of electrical equipment — Earthing arrangements and protective conductors